

PATENT COOPERATION TREATY

PCT

10/526547

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 300768WO/KCS/D		FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/IB 2002/003621	International filing date (day/month/year) 06.09.2002	Priority date (day/month/year) --	
International Patent Classification (IPC) or national classification and IPC H04B 7/06, H04B 7/12			
Applicant Nokia Corporation et al			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>1</u> sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 05.03.2004		Date of completion of this report 14.12.2004	
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88		Authorized officer Peder Gjervaldsaeter/ELY Telephone No. +46 8 782 25 00	

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB 2002/003621

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-10 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages 11-12 as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 13 received by this Authority on 2004-07-23

pages* _____ received by this Authority on _____

☒ the drawings:

pages 1-5 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (specify): _____
☐ any table(s) related to the sequence listing (specify): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (specify): _____
☐ any table(s) related to the sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	2-6, 10-14	YES
	Claims	1, 7-9, 15-16	NO
Inventive step (IS)	Claims		YES
	Claims	1-16	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)**The claimed invention**

The claimed invention relates to the problem concerning establishing an uplink connection in a fading situation. The problem is solved by changing a parameter in sequential preamble signals transmitted from the terminal resulting in signal diversity of sequential preambles,

Prior art

In the International Search Report the following documents were cited:

D1: ETSI TS 125 211 V4.3.0

D2: IEEE 1996, Mogensen et al.: "On antenna- and frequency diversity in GSM related systems (GSM-900, DCS-1800 and PCS1900)"

D3: IEEE 2001, Friedlander et al.: "Beamforming vs. Transmit diversity in the downlink of a cellular communications system"

D4: EP 0 749 216

D5: US 4 513 412

D1 describes the standardised uplink initiation procedure in UMTS. According to this procedure one or several access preambles are transmitted from the terminal. The power of each preamble sent is increased until the base station confirms reception of a preamble and connection can be established. (See section 5.2.2.2.1 and figure 6.)

D2 describes antenna and frequency diversity in GSM related systems. (See sections I-III.)

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: Box V

D3 describes beamforming and transmit diversity in a cellular system and compares the two methods. (See sections 2.1 and 2.2.)

D4 describes an antenna operating in antenna transmit diversity and in "angle diversity". (See claim 1 and column 1, line 27 - column 3, line 7.)

Document D5 represents the prior art. The claimed invention is not considered to be anticipated by this document.

Statement of reason

Claims 1, 7-9 and 15-16

The alteration of the diversity mentioned in the independent claims is not specified.

In document D1 time diversity is achieved between the preambles by transmitting them at different times. And an altered diversity is further achieved by increasing the power level of the sequential preambles.

What is claimed in these claims is thus already known from D1 and is not novel.

Note:

The initiation procedure shown in figure 6 in D1 is very well known to persons skilled in the art of mobile communications. The specific details about how this works is common knowledge for skilled persons and are not discussed here since they have no relevance regarding the statements on novelty and inventive step.

Claims 2, 3, 10 and 11

In these claims transmit antenna diversity is implemented in the system. Transmit antenna diversity is very well known in the field of radio transmission, see for example any of the

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

documents D2-D4. It is therefore considered to be an obvious measure for a person skilled in the art to implement antenna diversity, as shown in either of D2-D4, in the system in D1 when transmitting over a fading channel. What is claimed in claims 2, 3, 10 and 11 is therefore not considered to involve an inventive step.

Claims 4 and 12

Frequency diversity is also very well known for a skilled person and is therefore considered obvious to implement in bad signal conditions. It is therefore considered obvious for him to implement frequency diversity, as shown in D2, in the system in D1. What is claimed in claims 4 and 12 is thus not considered to involve an inventive step.

Claims 5, 6, 13 and 14

In these claims beamforming is used for the different preambles. Beamforming is also a well known technique in radio transmission, see for example D3 and D4. It is considered obvious for a skilled person to implement beamforming in the system in D1 when needed. What is claimed in these claims is therefore not considered to involve an inventive step.

To sum up:

What is claimed in claims 2-6 and 10-14 is novel, but what is claimed in claims 1, 7-9 and 15-16 is not novel. What is claimed in claims 1-16 fails to involve an inventive step, but comprises industrial applicability.

12. A mobile telecommunications terminal according to claim 9 or 10, wherein the transmission parameter includes a frequency band, each preamble being transmitted via the frequency band indicated by the current transmission parameter.
- 5 13. A mobile telecommunications terminal according to any one of claims 9 to 12, wherein the transmission chain includes a plurality of antennae in an antenna array, and directionality of a beam formed by signals transmitted from the array is selected for each preamble transmission based on the transmission parameter.
- 10 14. A mobile telecommunications terminal according to claim 13, wherein the transmission chain includes a phase shifting means for shifting the phase of the signals supplied to the individual antennae in the antenna array, the phase shifters being controllable on the basis of the transmission parameter.
- 15 15. A mobile telecommunications terminal according to any one of claims 9 to 14, wherein the uplink is established in accordance with the transmission parameter used when the base station successfully received the preamble.
- 20 16. A mobile telecommunications terminal according to any one of claims 9 to 15, wherein the transmission parameter includes a power level at which each preamble is transmitted, the power level being increased between at least some sequentially adjacent preamble transmissions.